DEPARTMENT of ENVIRONMENTAL SERVICES Water Supply & Pollution Control Division - Biology Bureau

LAKE TROPHIC DATA

MORPHOMETRIC:

Lake: HIGHLAN	ND LAKE	Lake Area (ha):	85.39
Town:	ANDOVER	Maximum depth (m):	13.4
County:	Merrimack	Mean depth (m):	5.0
River Basin:	Merrimack	Volume (m³):	4278500
	43°27'24" N	Relative depth:	1.3
Longitude:	71°45'29" W	Shore configuration:	1.43
Elevation (fi	t): 645	Areal water load (m/yr)): 7.49
Shore length	(m): 4700	Flushing rate (yr^{-1}) :	1.50
Watershed are	ea (ha): 1320.9	P retention coeff.:	0.59
% watershed p	ponded: 0.0	Lake type: natura	al w/dam

BIOLOGICAL:	13 February 1995	22 July 1994
DOM. PHYTOPLANKTON (% TOTAL) #1	ASTERIONELLA 90%	ASTERIONELLA 80%
#2		
#3		
PHYTOPLANKTON ABUNDANCE (units/mL)		
CHLOROPHYLL-A (µg/L)		4.20
DOM. ZOOPLANKTON (% TOTAL) #1	KERATELLA 25%	CALANOID COPEPOD 32%
#2	NAUPLIUS LARVA 25%	NAUPLIUS LARVA 27%
#3	ACTINOPHRYS 22%	
ROTIFERS/LITER	44	13
MICROCRUSTACEA/LITER	23	28
ZOOPLANKTON ABUNDANCE (#/L)	89	41
VASCULAR PLANT ABUNDANCE		Scattered
SECCHI DISK TRANSPARENCY (m)		5.8
BOTTOM DISSOLVED OXYGEN (mg/L)	1.7	0.4
BACTERIA (E. coli, #/100 ml) #:		
#2		
#:		

SUMMER THERMAL STRATIFICATION:

stratified

Depth of thermocline (m): 5.0 Hypolimnion volume (m³): 810000 Anoxic volume (m³): 252500

CHEMICAL:			HIGHLAND ANDOVER	LAKE	
	13 Febru	uary 1995	5 22 July 1994		
DEPTH (m)	4.5	9.5	1.0	5.0	10.0
pH (units)	7.0	6.8	6.7	6.9	6.1
A.N.C. (Alkalinity)	6.6	7.5	4.3	5.0	5.7
NITRATE NITROGEN	< 0.10	0.06	0.06	0.07	0.05
TOTAL KJELDAHL NITROGEN	< 0.10	0.23	0.16	0.29	0.24
TOTAL PHOSPHORUS	0.007	0.007	0.009	0.007	0.015
CONDUCTIVITY (µmhos/cm)	41.7	49.7	42.1	41.7	43.7
APPARENT COLOR (cpu)	24	28			
MAGNESIUM			0.65		
CALCIUM			2.6		
SODIUM			3.6		
POTASSIUM			0.60		
CHLORIDE	5	6	3	3	3
SULFATE	4	4	5	5	4
TN : TP		41	24	51	19
CALCITE SATURATION INDEX			3.6		

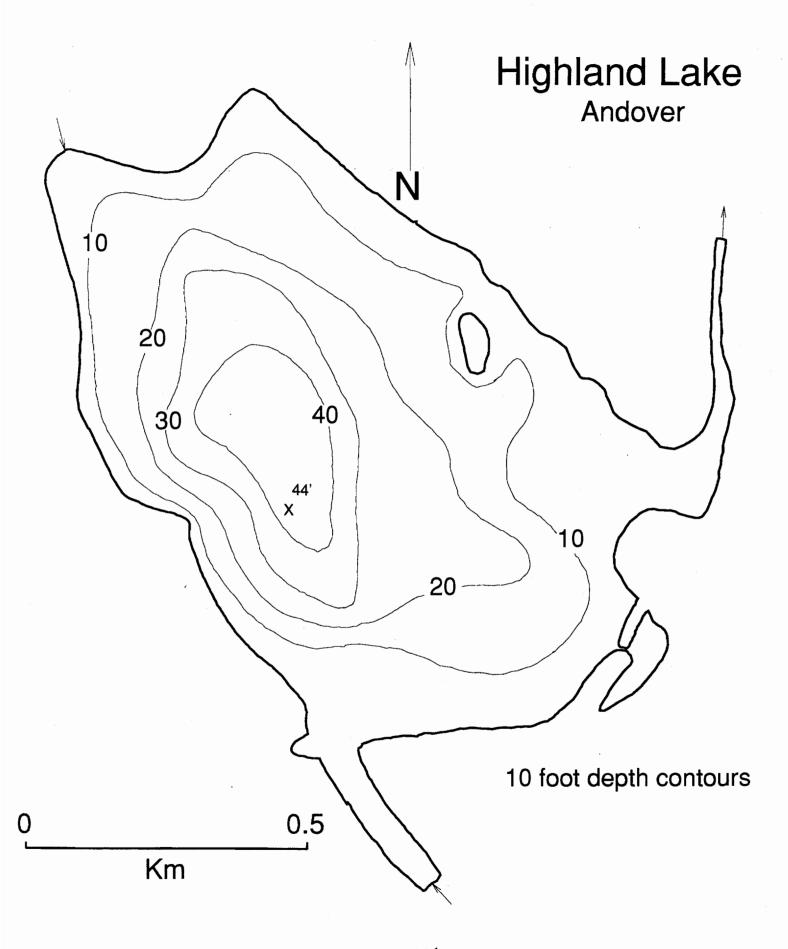
All results in mg/L unless indicated otherwise

TROPHIC CLASSIFICATION: 1994

D.O.	S.D.	PLANT	CHL	TOTAL	CLASS
5	1	1	1	8	Meso.

COMMENTS:

- 1. This lake was previously surveyed and classified in 1978. There was no change in trophic classification and little change in water quality between the two years, although the bottom dissolved oxygen depletion was more severe and more extensive in 1994.
- 2. Highland Lake has participated in DES' Volunteer Lake Assessment Program (VLAP) since 1987. The VLAP data shows improving trends in both chlorophyll and water clarity.



FIELD DATA SHEET

LAKE: HIGHLAND LAKE TOWN: ANDOVER DATE: 07/22/94 WEATHER: HAZY, HOT & HUMID

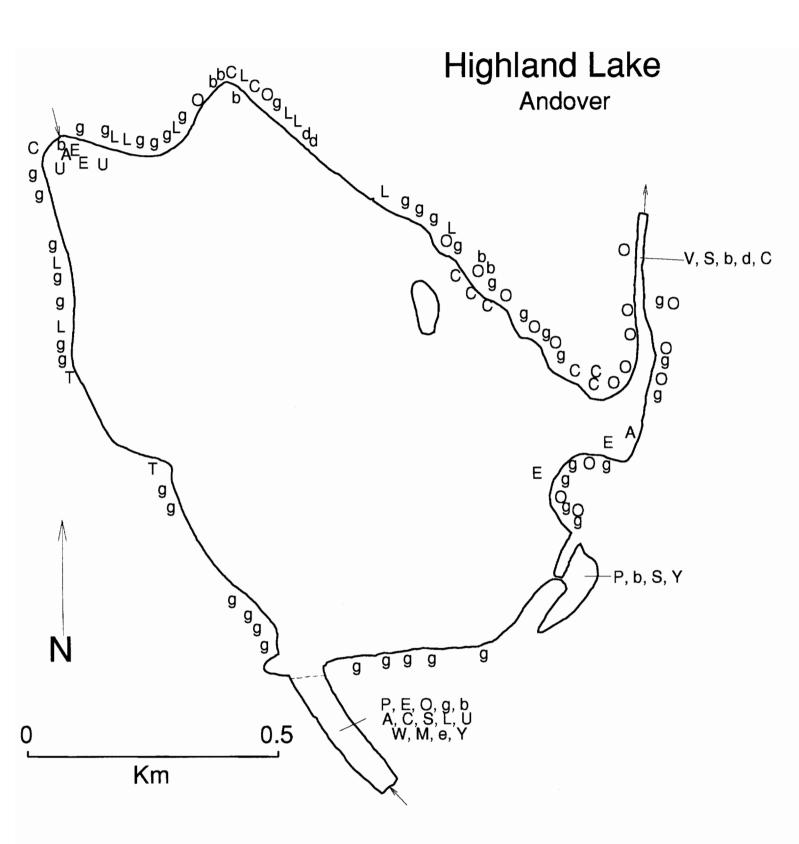
DEPTH (M)	TEMP (°C)	*DISSOLVED OXYGEN	OXYGEN SATURATION
0.1	26.0	8.7	106 %
1.0	25.4	8.7	104 %
2.0	25.3	8.7	104 %
3.0	24.0	8.8	103 %
4.0	22.0	8.5	96 %
5.0	18.0	8.9	92 %
6.0	13.8	4.9	46 %
7.0	12.0	3.0	28 %
8.0	11.0	3.0	27 %
9.0	10.7	1.9	16 %
10.0	10.0	0.3	3 %
11.0	9.8	0.3	3 %
12.0	9.8	0.4	3 %
		L-A-1-1-1	
	and the second s		

SECCHI DISK (m): 5.8 COMMENTS:

BOTTOM DEPTH (m): 13.1

TIME: 1100

*Dissolved oxygen values are in mg/L



AQUATIC PLANT SURVEY

LAKE: HIGHLAND LAKE TOWN: ANDO		TOWN: ANDOVER	DATE: 07/22/94
7.0	PLANT	ABUNDANCE	
Key	GENERIC	COMMON	ABUNDANCE
Т	Typha	Cattail	Sparse
g	Myrica gale	Sweet gale	Common
0	Cephalanthus occidentalis	Buttonbush	Scattered
E	Eriocaulon septangulare	Pipewort	Sparse
A	Sagittaria	Arrowhead	Sparse
P	Pontederia cordata	Pickerelweed	Sparse
d	Dulichium arundinaceum	Three-way sedge	Sparse
b	Scirpus	Bulrush	Sparse
С	Cyperaceae	non-flowering sedge	Sparse
S	Sparganium	Bur reed	Sparse
v	Vallisneria americana	Tape grass	Sparse
L	Chamaedaphne calyculata	Leatherleaf	Sparse
U	Utricularia	Bladderwort	Sparse
е	Eleocharis	Spike rush	Sparse
W	Potamogeton	Pondweed	Sparse
M	Myriophyllum humile	Water milfoil	Sparse
Y	Nuphar	Yellow water lily	Sparse

OVERALL ABUNDANCE: Scattered

GENERAL OBSERVATIONS:

- The plant map suggests plants were more common in 1994 than in 1978, but most of the plants listed are shoreline/terrestrial plants: sweet gale, leatherleaf and buttonbush. More species of plants were listed in 1994, but the overall abundance of the fully aquatic plants was similar in the two years.
- 2. Plants were locally abundant in two southern coves and the outlet channel but were sparse in the lake proper (excluding terrestrial plants) for an overall rating of Scattered.